Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1-14. (canceled)

15. (currently amended) An ion pump comprising:

an insulating layer;

a first conductive layer situated on the upstream side of the insulating layer;

a second conductive layer situated on the downstream side of the insulating layer;

a plurality of openings situated in the first conductive layer, the insulating layer and the second conductive layer forming channels having a first upstream and a second downstream discharge device electrodes, wherein the first electrode has a sharp-like shape at an upstream end and a blunt downstream end, wherein the plurality of openings are grouped into upstream inputs formed by the first electrode and downstream outputs formed by the second electrode, and the openings situated at inputs are formed by upstream sharp-like conductor ends and the openings situated at outputs are formed by downstream non-sharp-like conductor ends; and

an enclosure containing the channels and having an input port proximate to an input side of the plurality of openings and an output port proximate to an output side of the plurality of openings, wherein a fluid in the enclosure can be transported between the input port and output port by being forced through the plurality of openings;

~~The pump of claim 2,~~ wherein [[the]] each opening of the plurality of openings is sized for a ratio, R, of an axial length equal to a thickness of the insulator, to an inner diameter, of each opening to maximize a performance of the pump, having approximately $1 \leq R \leq 10$, and the thickness of the insulator about $6\ \mu m \leq S \leq 100\ \mu m$.

16-17. (canceled)

18. (currently amended) An ion pump comprising:

an insulating layer;

a first conductive layer situated on the upstream side of the insulating layer;

a second conductive layer situated on the downstream side of the insulating layer;

a plurality of openings situated in the first conductive layer, the insulating layer and the second conductive layer forming channels having a first upstream and a second downstream discharge device electrodes, wherein the first electrode has a sharp-like shape at an upstream end and a blunt downstream end, wherein the plurality of openings are grouped into upstream inputs formed by the first electrode and downstream outputs formed by the second electrode, and the openings situated at inputs are formed by upstream sharp-like conductor ends and the openings situated at outputs are formed by downstream non-sharp-like conductor ends;

an enclosure containing the channels and having an input port proximate to an input side of the plurality of openings and an output port proximate to an output side of the plurality of openings, wherein a fluid in the enclosure can be transported between the input port and output port by being forced through the plurality of openings; and

a number of consecutive stages, L, of channels, and having an applied voltage, U, as required to achieve a desired total pressure head, $\Delta p_t = n \cdot \Delta p$, where an achieved pressure head at each stage is about Δp, including compensation for the changes in absolute pressure, gas volume due to compressibility, and temperature at each stage, which entails changes in pump effectiveness and capacity at each stage;

wherein a number of openings, n, of the plurality of openings, stages, L, and applied voltage, U, are selected so that a desired total pumping volumetric rate and total pump head pressure can be achieved, including

compensation for a pressure drop through the pump, and a required number of openings, n_O, and compensation for a pressure drop through the analyzer load; and

~~The pump of claim 17,~~ wherein:

the number of openings, n, is increased by a factor $\alpha = n/n_O = \Delta p_O /(\Delta p_O - \Delta p_L)$;

Δp_O = pump pressure head without a load;

Δp_L = pressure drop through the load; and

$\Delta p_O \sim 2 \cdot \Delta p_L$.

19-20. (canceled)

21. (currently amended) An ion pump comprising:

an insulating layer;

a first conductive layer situated on the upstream side of the insulating layer;

a second conductive layer situated on the downstream side of the insulating layer;

a plurality of openings situated in the first conductive layer, the insulating layer and the second conductive layer forming channels having a first upstream and a second downstream discharge device electrodes, wherein the first electrode has a sharp-like shape at an upstream end and a blunt downstream end, wherein the plurality of openings are grouped into upstream inputs formed by the first electrode and downstream outputs formed by the second electrode, and the openings situated at inputs are formed by upstream sharp-like conductor ends and the openings situated at outputs are formed by downstream non-sharp-like conductor ends; and

an enclosure containing the channels and having an input port proximate to an input side of the plurality of openings and an output port proximate to an output side of the plurality of openings, wherein a fluid in the enclosure can be transported between the input port and output port by being forced through the plurality of openings;

wherein the sharp-like conductor ends and non-sharp-like conductor ends are situated in the first conductive layer to generate in-situ ions proximate to the sharp-like conductor ends;

the in-situ ions predominantly have the polarity of the sharp-like conductor ends, which then induce a fluid flow of neutral molecules as a result of a force and viscous drag of the in-situ ions and away from the sharp-like conductor ends; and

~~Pump means of claim 3,~~ wherein each of the sharp-like conductor ends are recessed to a larger inner diameter than an inner diameter of each of the plurality of openings in the insulating layer, by a distance equal to about 10 to 20 percent of the inner diameter of an opening in the insulating layer, to enable removal of non-predominant polarity ions before remaining predominant ions enter the inside diameters of the plurality of openings in the insulating layer.

22-54. (canceled)